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Demographics, behaviors, and sexual health characteristics of high risk men who have sex with men and transgender women who use social media to meet sex partners in Lima, Peru

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Abstract

Background—Men who have sex with men (MSM) and transgender women (TW) in Peru bear a disproportionate burden of Human Immunodeficiency Virus (HIV) and sexually transmitted infections (STIs). In a context of quickly expanding communication technology, increasing numbers of MSM and transgender women are using social media applications to seek sex partners. Understanding social media users and their sex partnering practices is needed to update HIV and STI prevention programming.

Methods—In Lima, Peru, 312 MSM and 89 TW from two STI clinics underwent HIV and STI testing and participated in a survey of demographics, behaviors, sexual health, and social media practices. Chi squared, t-tests, and Wilcoxon Mann-Whitney tests were used to compare those with and without recent social media sex partners.

Results—MSM with social media sex partners were younger, more educated, and more likely to identify as gay. They were significantly more likely to report greater numbers of sex partners, including anonymous sex partners; sex in higher-risk venues, orgies, and have rectal *Neisseria gonorrhoeae* or *Chlamydia trachomatis* infection. TW with social media sex partners were also younger, more likely to participate in sex work, and have a lower rate of RPR positivity or history of syphilis. Participants reported using several social media sites including sexual hook-up applications, websites for gay men, pornographic websites, and chat sites, but the most common was Facebook.

Conclusions—Prevention strategies targeting Peruvian MSM and transgender women who use social media are needed to address higher-risk sexual behavior and the high burden of STIs.

Short Summary

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Among Peruvian MSM, social media users were younger, more educated, gay, practiced riskier sex, and had rectal gonorrhea or chlamydia. Transgender women social media users frequently participated in sex work, and had lower rates of RPR positivity.

Keywords

Men who have sex with men; transgender; Peru; social media; Internet; Human Immunodeficiency Virus; sexually transmitted infections

Introduction

Men who have sex with men (MSM) and transgender women in Peru have been found to have a high prevalence of Human Immunodeficiency Virus (HIV) and sexually transmitted infections (STIs) compared to the general population. HIV prevalence in MSM has been estimated at 12.4%(1), and among transgender women it has been found to be as high as 30%(2). Similarly, prevalence of recent syphilis has been estimated to be about 12% in surveillance studies among MSM(3, 4). *Neisseria gonorrhoeae* and *Chlamydia trachomatis* have also been found to be present at high levels in extra-genital sites (19% anal, 4.8% pharyngeal)(5). As a result, it is of great public health interest to identify strategies that enhance prevention of the transmission and acquisition of HIV and STIs in these populations.

In recent years, sex-related Internet and social media usage has been found to be associated with increased risk for HIV(6–8) and STI(9) acquisition among MSM in a number of countries. In Peru, it has been found that Peruvian college students, compared to U.S. college students, used the Internet significantly more to view sexually explicit material, find sex partners, and search for sex-related information(10), suggesting the importance of the Internet as a potential vehicle for sexual health interventions. Internet-based surveys in Peru have suggested that MSM who use the Internet are young, identify as homosexual, and that almost half have never been tested for HIV infection(11). A 2006 study reported that 58% of MSM used commercial cybercafés as their primary place of Internet access(12), though this may be changing; a more recent 2012 study showed 87.9% computer ownership among MSM recruited for an Internet-based study(13). There have been studies that have tested Facebook(13) and Internet banner advertisement(12) interventions in Peru to increase uptake of HIV testing, which have been met with varying levels of success.

Our analysis aims to provide a comparison of the demographic, behavioral, and sexual health characteristics of Peruvian MSM and transgender women who met sex partners using social media and those who did not. We also describe contemporary Internet and social media use by MSM and transgender women in Peru.

Material and Methods

Sample and selection

As part of a two-year cohort study (Picasso cohort), 312 MSM and 89 male-to-female transgender women ≥18 years old were recruited from a government-run (Alberto Barton)

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and a community (Epicentro Salud) STI clinic in Lima, Peru. The study recruited participants at high risk for HIV and/or STI acquisition as determined by reporting recent specific risky sexual behaviors, history of syphilis, genital ulcerative disease, and/or HIV infection(14). Ethical approval and oversight was provided by the Institutional Review Boards at the Universidad Peruana Cayetano Heredia and the University of California, Los Angeles.

Variables

Trained study staff administered a 139-question survey using a structured computer-assisted personal interview tool. Questions addressed demographic characteristics, including age, highest educational level (secondary or less vs any post-secondary education), financial vulnerability (ran out of money for basic needs in last 12 months), living arrangements, and sexual/gender identity (gay, transgender, bisexual/heterosexual/other). Behavioral data were also collected including number of male sex partners in the last 3 months, preferred anal sex role (insertive, receptive, versatile), anal sex venues in the last 3 months (sauna, dark room of a club/disco, public space, hotel, salon), types of anal sex partners in last 3 months (i.e. anonymous partner, sex worker, sex client, a partner with whom the participant exchanged gifts/goods for sex, new sex partner, partner in an orgy), alcohol use, and drug use before last sexual encounter. Alcohol use was assessed using the Alcohol Use Disorder Identification Test (AUDIT)(15); a score ≥8 was considered harmful alcohol use. Participants with social media sex partners were defined as those who reported anal sex within the last 3 months with a male partner found on the Internet or social media (including mobile phone geosocial network applications). The sexual health survey included the frequency of HIV testing (never, less than yearly, at least yearly), self-reported HIV status and antiretroviral therapy usage, and history of syphilis. HIV positive (as defined below) participants were classified as having “known HIV infection” if they reported an HIV diagnosis in the questionnaire, while those with “unknown HIV infection” reported the last test being negative or never having been tested for HIV. A separate question asked participants whether or not they met a sex partner in the last three months. Those who answered “yes” identified the top three places where they met sex partners. The top Internet/social media sites were tabulated for those who reported them.

Laboratory testing

Participants were tested for HIV-infection using a rapid test (Determine, Alere Inc., Waltham, MA, USA) and enzyme immunoassay (EIA) (Genscreen TM ULTRA HIV Ag-Ab, Bio-Rad, France). Those with a reactive EIA and/or positive rapid test had a confirmatory Western blot (WB) (NEW LAV BLOT I, Bio-Rad, France). Testing for syphilis included an initial Rapid Plasma Reagin (RPR) test (BD Macro-Vue RPR, Beckon-Dickenson, NJ) which if reactive was used to establish specific titers followed by confirmation with a *T. pallidum*-Particle Agglutination test (TPPA) using a cutoff value of > 1:80 (Serodia TP-PA, Fujirebio Inc, Japan). Recent syphilis was defined as an RPR titer ≥1:16 and a positive TPPA. Patients were instructed in proper self-collection of anal swabs which were tested using the Aptima Combo 2 *C. trachomatis/N. gonorrhoeae* assay (Hologic, San Diego, CA, USA). Participants found to be infected were treated according to Peruvian national guidelines.

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Statistical analysis

Descriptive statistics were performed for those with and without social media sex partners. Differences between the two groups were identified using Pearson's Chi-square test (or Fisher's Exact test) for categorical variables, independent t-test to compare means, and Wilcoxon Mann-Whitney test to compare medians. Separate analyses were performed for MSM and TW. All analyses were performed using Stata 14.1 (College Station, TX).

Results

There were several important demographic differences between participants with and without social media sex partners (Table 1). Among MSM, those with social media sex partners were significantly younger and more likely to have post-secondary education, and report a gay sexual identity. TW reporting social media sex partners were also younger and more likely to live with family than those without social media sex partners. A smaller proportion of TW overall had higher education compared to MSM (18% vs 61%). Both groups had high financial vulnerability, with about 60% running out of money for basic needs in the last 12 months.

As a whole, those with social media sex partners also reported a greater number of associated risky behaviors. MSM with social media sex partners reported more male sex partners in the past 3 months (median 5 vs 3) and were more likely to report condomless anal sex and anal sex in other locations including hotels, dark rooms of clubs/discos, and saunas. They were also significantly more likely to report sex in the past 3 months with anonymous partners, new sex partners, and in orgies. TW as a whole had greater numbers of male sex partners (15 vs 4) and were more likely to report sex with a client (66% vs 17%) than MSM. TW reporting social media sex partners were more likely to have sex with an anonymous partner, a sex client, a partner in exchange for goods or gifts, a new sex partner, and in an orgy compared to those without social media sex partners. Among both MSM and TW, there were not significant differences in the alcohol and drug-use between those with and without social media sex partners, though almost half of MSM and TW had an AUDIT score ≥ 8, indicating high frequency of harmful drinking overall.

Regarding sexual health characteristics, 17% of study participants had never been tested for HIV, and 25% tested less than yearly. Overall, 118 participants were infected with HIV, with 39 (33%) unaware of their infection, and 46% of those with known HIV infection on antiretroviral therapy. MSM with social media sex partners reported more frequent HIV testing and higher proportion of rectal *Neisseria gonorrhoeae* or *Chlamydia trachomatis* infection (30% vs 15%) than those without. TW with social media sex partners were less likely to have baseline RPR positivity or history of syphilis than those without.

Among those who reported meeting a sex partner in the last 3 months (n=288), 53% reported hotels among their top 3 meeting venues, followed by social media (19%), saunas (16%), discos (12%), and clubs (6%) (data not shown). Those who met a sex partner in the last 3 months using social media (n=55), most commonly reported using Facebook (35%) and Manhunt (18%). A number of websites specific to the gay community in Peru were also reported by participants, as were several pornographic websites, international gay social/

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sexual networking websites, and chat websites that are not specific to MSM. Many websites are also available as mobile applications (Table 2).

Discussion

The demographic characteristics of MSM with social media sex partners in our study reveal a younger, more educated group that is more likely to self-identify as gay. Our findings are consistent with previous Internet-based studies done in Peru(11–13, 16), which reinforces the external validity of our findings. While it might make sense for those who do not identify as gay to be more likely to use the Internet or social media to find sex partners because of their anonymity, studies, including ours, show the opposite, though we cannot know for sure whether the study participants are open about their gay identity when seeking partners. A large proportion of the TW have not had higher education, highlighting the need to tailor social media and non-electronic outreach materials to TW to appropriate levels of health literacy.

The significant differences in sexual behaviors between those with and without social media sex partners were striking. Among MSM with social media sex partners, the high risk sexual practices, including a greater number of recent sex partners, sex with new and anonymous partners, and participation in ‘orgies’ (i.e. group sex) indicate the need to specifically target social media users with HIV and STI prevention interventions. MSM with social media sex partners also reported a greater diversity of venues where sex occurred which included hotels, dark rooms of clubs/discos, and saunas. These data suggest that brick-and-mortar venues like hotels should be places where more efforts are prioritized, as many of those men also go to these venues to have sex.

It is also important to note that more than a quarter of our study participants reported sex with a client, while one in sixteen reported sex with a sex worker in the last three months, emphasizing the high-risk sexual practices of our study participants. The prevalence of sex work was much higher among TW compared to MSM, and highest in those TW who reported social media sex partners. Additionally, a significantly higher proportion of TW with social media sex partners reported informal types of compensated sex (i.e. sex in exchange for goods or gifts). This is consistent with other studies of Peruvian MSM and TW sex workers, which found that independent forms of sex work (i.e. apart from escort agencies for the middle class or ‘street-walking’ for the working class) have become more frequent with the rise of the Internet and mobile phones, enabling sex workers to remain anonymous, safer, and have a steadier client base while staying off the streets(17). This pattern of sexual activity allows for occasional sex work, and can reach a broader socioeconomic range of clients. A previous Internet-based study among HIV-infected MSM in Latin America found that those who were paid for transactional sex had decreased odds of receiving medical care for HIV(18). Given how common transactional sex and HIV were within our study population, knowing how to reach social media users, particularly TW, may have important implications for controlling the HIV epidemic under the paradigm of treatment as prevention(19).

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While the prevalence of alcohol and drug use was not different between those with and without social media sex partners, alcohol use was very high in both groups. Other studies in Peru have found that alcohol use disorders were associated with riskier sexual practices(20), including condomless sex, casual sex, and sex with unknown persons; drug use has not been significantly associated with sexual risk behaviors(21). Reducing problematic alcohol use among MSM and TW could help decrease the occurrence of risky sexual behaviors, leading to better control of HIV and STIs.

The sexual health characteristics of our participants with and without social media sex partners were mostly similar. The proportion of subjects with HIV and STIs in our sample likely overestimates the prevalence among Peruvian MSM and TW, as this was a clinic-based cohort and our study inclusion criteria specifically recruited those with higher risk for transmission and acquisition of HIV and STIs. Nevertheless, it is notable that a third of those who were HIV-infected were not aware of their infection and one in six had never been tested for HIV, emphasizing the need to achieve more widespread HIV testing. Improving uptake of antiretroviral therapy could also help in decreasing the transmission of HIV. Finally, among MSM there was a high prevalence of rectal *Neisseria gonorrhoeae* or *Chlamydia trachomatis* infection, which are often asymptomatic. Much of the STI care in Peru relies on syndromic management(22), and Peruvian guidelines do not include a specific syndromic algorithm for rectal infections(22) nor is laboratory screening standard practice. The higher prevalence of baseline RPR positivity and history of syphilis in the TW who did not report social media sex partners may be a reflection of their older age, having had more time for sexual encounters since their sexual debut. One of the strengths of our study, compared to other Internet based surveys, was that our STI and HIV infection measures were not based on self-report, allowing for unbiased linkage of test results and survey responses.

Finally, our study sheds light on not only the venues where MSM and TW have sex, but also on the places where they report meeting. In both of these situations, study participants reported that hotels were the most common places to meet sex partners as well as to have sex. This may be a reflection of the need for privacy or the feeling of stigma associated with same-sex behavior from family members, since most study participants live with family. Many of the hotels reported are near downtown Lima and also function like sex venues, with affordable rooms available for a few hours. Several of our participants have explained that MSM and TW congregate at some of those hotels to meet sex partners. Further HIV and STI prevention outreach efforts may include working with popular hotels to promote testing and safer sex practices. Though social media was the second most common “meeting place”, the continued importance of brick-and-mortar venues is clear.

Internet and social media usage are increasing rapidly in Peru. In 2015, 76% of Peruvian adults ages 18–34 reported using the Internet at least occasionally or owning a smartphone, and 80% of these used social networking sites(23). Understanding how this technological diffusion affects sexual networks may be important in controlling the transmission of HIV and STIs. Study participants reported using a variety of social media ranging from sexual hook-up applications, to texting/messaging sites, to websites marketed toward gay men specific to Peru. The most reported social media site was Facebook. This may be due to the

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pervasiveness of Facebook, as well as the lack of specificity to sexual networking, which may be perceived positively if there is stigma surrounding sexual hook-up applications. A Facebook intervention (13) and an online video-based intervention (16) had some success in increasing testing rates. However, overall testing rates in both studies were below 20%. Further research is needed to identify more effective methods to improve follow-through with HIV and STI testing, especially since those who actually complete testing represent a small proportion of those who intend to test(16). In addition, more contemporary data on the location of Internet access are needed though there is evidence of a shift from commercial cybercafés(12) to personal computers(13) and smartphones(23). Regardless of the platform, Peruvian MSM have emphasized that messages must address the fear of getting tested, improve risk perception, and increase comfort with the testing venue (including personnel) (24). Finally, there is increasing awareness of corporate social responsibility for companies that produce online hook-up sites. Corporate social responsibility is the concept that these companies should take responsibility for their business practices by encouraging or supporting programs and messages that may positively impact the community(25). Efforts to partner with these companies in delivering public health messages may be another modality that can be explored in Peru.

Our study was not without limitations. First, our study specifically aimed to recruit participants at high risk for acquisition and/or transmission of HIV and STIs from STI clinics, and may not perfectly represent the MSM and transgender women in Peru. Nevertheless, our demographics and findings are consistent with other studies(26, 27) and identify some characteristics that may be helpful in designing testing and prevention interventions for people with social media sex partners. Moreover, our study was not conducted through the Internet, but assessed social media use in a sample from which questionnaire and biological measurements were made, allowing for a more detailed survey and linkage with STI and HIV testing results. In addition, sample size was small, particularly for TW, which limits the generalizability. Nevertheless, we performed separate analyses for MSM and TW, since they do represent separate populations with unique characteristics, instead of conflating them, as is often done in many other studies.

To conclude, our study suggests that MSM who use social media to find sex partners possibly represent a distinct group of younger, more educated individuals, more likely to identify as gay, who nevertheless participate in a wider range of riskier sexual practices, and have higher prevalence of rectal *Neisseria gonorrhoeae* or *Chlamydia trachomatis* infection. Among TW, those with social media sex partners were younger, more likely to participate in sex work, and less likely to have a positive RPR or history of syphilis. The high frequency of brick-and-mortar venues and the diversity of social media sites that were reported as sex and meeting venues are important to recognize in order to better deliver combination HIV prevention strategies where improved testing linked to care and treatment, as well as oral pre-exposure prophylaxis, can be added to traditional efforts to increase consistent condom use and ‘safer’ sexual practices.

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Table 1

Demographic, Behavioral, and Sexual Health Characteristics of Study Participants, Picasso Cohort, Lima, Peru, 2013–2014

	Men who have sex with men			Transgender women		
Characteristics	**Did not have social media sex partner n=197**	**Had social media sex partner n=115**	**p-value**	**Did not have social media sex partner n=60**	**Had social media sex partner n=29**	**p-value**
Demographics:						
Age, mean(SD)	32.5 (9.8)	28.5 (8.0)	<0.001	35.6 (9.8)	30.3 (9.3)	0.017
<25	56 (28%)	50 (43%)	0.003	7 (12%)	10 (34%)	0.025
25–35	71 (36%)	43 (37%)		24 (40%)	11 (38%)	
>35	70 (36%)	22 (19%)		29 (48%)	8 (28%)	
Highest educational level						
Secondary or less	86 (44%)	32 (29%)	0.007	52 (87%)	21 (72%)	0.101
Any post-secondary or above	109 (56%)	80 (71%)		8 (13%)	8 (28%)	
Ran out of money for basic needs in last 12 mo	122 (62%)	66 (57%)	0.429	36 (60%)	20 (69%)	0.412
Lives with family	141 (72%)	92 (80%)	0.099	25 (42%)	20 (69%)	0.016
Sexual identity						
Gay	126 (64%)	93 (81%)	0.002	N/A	N/A	
Bisexual/heterosexual/other	71 (36%)	22 (19%)		N/A	N/A	
Behavioral characteristics:						
# of male sex partners last 3 mo, median (IQR)	3 (1–5)	5 (3–10)	<0.001	15 (4.5–50)	15 (6–25)	0.739
≤3	120 (61%)	32 (28%)	<0.001	12 (20%)	2 (7%)	0.214
4–10	55 (28%)	58 (50%)		14 (23%)	10 (34%)	
>10	22 (11%)	25 (22%)		34 (57%)	17 (59%)	
Anal sex role						
Insertive	63 (32%)	24 (21%)	0.097	1 (2%)	1 (3%)	0.912
Receptive	42 (21%)	26 (23%)		41 (68%)	19 (66%)	
Versatile	92 (47%)	65 (57%)		18 (30%)	9 (31%)	
Condomless anal sex, last 3 mo	136 (69%)	92 (80%)	0.035	43 (71%)	21 (72%)	0.941
Location of anal sex in last 3 mo:						

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Characteristics	Men who have sex with men			Transgender women		
	Did not have social media sex partner n=197	Had social media sex partner n=115	p-value	Did not have social media sex partner n=60	Had social media sex partner n=29	p-value
Hotel	117 (59%)	84 (73%)	0.015	44 (73%)	26 (90%)	0.078
Public space	26 (13%)	17 (15%)	0.695	17 (28%)	12 (41%)	0.218
Dark Room of club/disco, etc	17 (9%)	30 (26%)	<0.001	5 (8%)	3 (10%)	0.712
Sauna	22 (11%)	30 (26%)	0.001	0	0	
Salon	9 (5%)	6 (5%)	0.796	3 (5%)	4 (14%)	0.209
Anal sex partners in last 3 mo:						
With anonymous partner	67 (34.0%)	83 (72%)	<0.001	26 (43%)	24 (83%)	<0.001
With sex worker	16 (8%)	6 (5%)	0.334	1 (2%)	2 (7%)	0.247
With a sex client	31 (16%)	23 (20%)	0.337	35 (58%)	24 (83%)	0.031
With a partner in exchange for goods or gifts	28 (14%)	21 (18%)	0.343	17 (28%)	18 (62%)	0.002
With a new sex partner	67 (34%)	88 (77%)	<0.001	18 (30%)	20 (69%)	<0.001
In an orgy	8 (4%)	20 (17%)	<0.001	3 (5%)	7 (24%)	0.012
AUDIT score ≥8	89 (45%)	50 (43%)	0.771	28 (47%)	14 (48%)	0.887
Drug use before last sex	9 (5%)	4 (3%)	0.774	10 (17%)	2 (7%)	0.323
Sexual health:						
Frequency of HIV testing[a]			0.023			0.596
Never	39 (20%)	16 (14%)		7 (12%)	6 (21%)	
Less than yearly	57 (29%)	29 (25%)		9 (15%)	4 (14%)	
At least yearly	100 (51%)	69 (61%)		43 (73%)	19 (66%)	
Known HIV	37 (19%)	22 (19%)	0.940	15 (25%)	5 (17%)	0.589
Unknown HIV	18 (9%)	12 (10%)	0.708	6 (10%)	3 (10%)	1.000
On ART (of those with known HIV)	15 (41%)	12 (55%)	0.296	7 (47%)	2 (40%)	1.000
History of syphilis[b]	68 (35%)	43 (37%)	0.632	29 (48%)	6 (21%)	0.012
Baseline RPR positivity	75 (38%)	56 (49%)	0.067	34 (57%)	9 (31%)	0.023
Recent Syphilis (RPR ≥1:16)	28 (14%)	24 (21%)	0.128	6 (10%)	0 (0%)	0.172
Rectal *N. gonorrhoeae* or *C. trachomatis*	30 (15%)	34 (30%)	0.002	12 (20%)	8 (28%)	0.422
N. gonorrhoeae[b]	11 (6%)	15 (13%)		6 (10%)	4 (14%)	

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Characteristics	Men who have sex with men			Transgender women		
	Did not have social media sex partner n=197	Had social media sex partner n=115	p-value	Did not have social media sex partner n=60	Had social media sex partner n=29	p-value
C. trachomatis[c]	20 (10%)	23 (21%)		7 (12%)	5 (17%)	

[a] 3 missing responses

[b] 1 missing response/result

[c] 9 missing results

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Table 2

Most Frequent Websites/Applications Used to Meet Sex Partners (n=55), Picasso Cohort, Lima, Peru, 2013–2014

Website/application	Available as mobile phone application	Number of participants[1]	Proportion
International social networking websites:			
Facebook (facebook.com)	x	19	35%
Manhunt (manhunt.net)	x	10	18%
Grindr (grindr.com)	x	3	6%
PlanetRomeo (planetromeo.com)	x	1	2%
Hornet (hornetapp.com)	x	1	2%
Peruvian gay websites:			
GAYPERU.COM (gayperu.pe)		4	7%
Gays Peruanos (gaysperuanos.com)		4	7%
Peruesgay (peruesgay.com)		2	4%
PERUGAY.com (perugay.com)		2	4%
Peruvian pornographic websites:			
Cholotube (cholotube.org)		1	2%
CholoTubeGay (cholotubegay.com)		1	2%
Chat websites:			
mIRC (mirc.com)		2	4%
Latinchat (latinchat.com)		1	2%
Badoo (badoo.com)	x	1	2%
FonoChat (fonochat.com)	x	1	2%
Interchat (inter-chat.com)		1	2%
Miscellaneous:			
"Internet" (unspecified)		10	18%
“Do not remember”		2	4%
Other[2]		2	4%
Internet cybercafé	x	1	2%

[1]Participants included up to 3 responses so the total does not add up to 55

[2]These two named sites/applications could not be found on the Internet